Soil Conservation

November 1979

U.S. Department of Agriculture

Investing in Our Conservation Future 2

A Worm's-Eye View 8

How Green Is My Valley 20

From the Administrator

What's Environmental Education Worth?

Not every insurance policy pays off in dollars.

An example is the investment of a conservation district's time in environmental education.

There is no better insurance against damage to our resources. It's a policy that will pay off handsomely when the children we help educate today make the right kind of resource decisions tomorrow.

Some busy conservationists don't agree. They protest that when demands on their time begin to mount, environmental education should take a low priority. After all, they ask, what's more important: helping a farmer lay out terraces or talking about soil conservation at a teacher workshop? The answer has got to be—both.

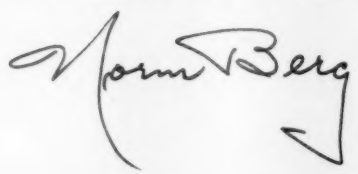
Many educators believe that, as a Nation, we haven't begun to invest enough time and money in teaching youngsters about their environment.

The U.S. Office of Education warns that "we have paid dearly for this neglect (of environmental education) in the land eroded and destroyed . . . water and air polluted . . . and in the daily waste of resources."

From kindergarten up, schoolchildren need the chance to learn about resources outdoors, in real-life situations. They need to analyze problems, plan projects, do useful work, and watch what happens as a result. A project doesn't have to be a major undertaking. It can be as simple as planting a tree, spreading woodchips on a nature trail, or throwing litter on the school compost heap. But it may teach city children a lesson they'll never forget.

To help district leaders and other conservation-minded people learn how they can help, there is an excellent new "Conservation District Guide for Education Programs," prepared by the National Association of Conservation Districts. Several State associations of districts are already putting the guide to use. It contains detailed suggestions for incorporating environmental awareness into school and college curricula, youth group programs, teacher inservice seminars, and adult workshops.

There is a bonus in such activities for the SCS employees and district supervisors who give them their time and effort. Working with children is one of the best ways to capture a fresh outlook on resource conservation. Their questions, their comments, and their enthusiasm can do as much for the conservationist as the conservationist is doing for the mind of the child.



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Soil Conservation

Contents

From the Administrator 2

Evaluating Teacher Education 4
Terence Mills and Jane S. Burris

Studying the Outdoors in the City 4
F. Dwain Phillips and Paul Hamilton

More Than a Walk Through the Woods 6
F. Dwain Phillips and John R. Bogard

Wee Willie Worm 8
Jeffrey R. Loser

Fort Roberdeau Park 9
Tim Emenheiser

Reviving a Tradition 10
Lowell Edminster and Michael Young

Learning Conservation From a Creek 12
Richard Heaslip

A Chemistry Class Helps SCS 12

Life at Bald Rock 14
Charles T. Mathews and Morris S. Gillespie

The Jim Hamm Nature Area 16
Eldie W. Mustard and Carrol Hamon

With One Good Example 18
James L. Harder

Looking Out for Wildlife 19
Gary Gross

A Lush Valley Assured 20
Steve Foland

Automated Pollutant Nabber 22
Joe B. Hays

News Brief 23

Meetings 23

Cover:
According to SCS Administrator Norman A. Berg, "children need the chance to earn about resources outdoors, in real-life situations." The articles on pages 4 through 17 present a variety of conservation education activities.

A Look at Conservation Education in Oklahoma

A study to find out if teachers are applying what they've learned; an outdoor classroom in the city; and a week-long environmental study camp are among the conservation education activities going on in Oklahoma.

Evaluating Teacher Education

by Terence Mills
and Jane S. Burris

An Oklahoma environmental education study that was concluded in 1977 is pointing the way to better conservation learning experiences for public school teachers and students in that State.

The study, which includes evaluation of programs, is part of the Conservation Education Leadership Training Program being done by Oklahoma State University at Stillwater; East Central State University, Ada; Southwestern State University, Weatherford; and Northeastern State University, Tahlequah. Teachers completing the conservation education program receive assistance and support from local conservation districts, the Soil Conservation Service, and the Oklahoma Conservation Commission.

Like most teacher inservice programs, the built-in evaluation procedure was originally limited to a course grade that goes on the student's record. Since this kind of evaluation does not attempt to quantify the implementation of programs or determine levels of change on the part of the individual teachers, a quantitative evaluation procedure was added during the 1977 training session.

During the graduate level summer program, teachers attend class 8 hours a day for a month to prepare themselves to return to their schools as leaders in the development of outdoor classrooms and environmental education programs.

The first phase in evaluating the effectiveness of the leadership training program involved tests taken by 60 participants before and immediately after the 4-week summer session. Statistical differences between pre- and post-test scores showed a significant increase in the teachers' knowledge of concepts related to the environment. There was also a similar gain in knowledge of available conservation education material. Prior to the program,

Studying the Outdoors in the City

by F. Dwain Phillips
and Paul Hamilton

Watching a bird hatch her eggs, a cottontail rabbit raise her young, and studying an ant den sound like outdoor classroom observations for kids in a rural community. But these and many more experiences in the outdoors are being shared by more than 400 students in Tulsa, Okla. Students at Columbus Elementary School study the outdoors in their 90- by 120-foot outdoor classroom on their schoolground in the middle of the city.

On May 17, 1979, nearly 500 parents and friends came to hear the mayor of Tulsa dedicate the first outdoor classroom in the Tulsa Public School System. It seems likely, with all the

Using plants donated for the outdoor classroom, Jane Burris shows students proper planting techniques.

teachers were generally not aware of the technical help, literature, and curriculum materials available to them in conservation education.

The second phase of program evaluation involved gathering data 8 months after the participants had returned to their teaching activities. This second phase was considered even more important than the first, because knowing that there was a significant gain in the teachers' knowledge was no guarantee that the conservation understanding of their pupils would be enriched.

In fact, the first phase showed no significant relationship existed between teacher gains in conservation concepts and actual implementation activity. A complete evaluation would be lacking until data were gathered on increased conservation activities in the schools. Therefore the second phase was conducted to determine the degree of implementation and to identify factors that influenced the implementation of conservation and environmental education activities.

The results indicate that 86 percent of the summer school respondents actually did implement a program in their schools. Furthermore, these teachers reported receiving additional assistance from the local conservation district board of directors as a cooperative effort developed between the local district and the schools.

The analysis showed a significant increase in the use of the out-of-doors as a learning laboratory and in the number and variety of subject matter areas in which environmental concepts were included—such as art, music, social sciences, and math as well as in science.

Surprisingly, there was no apparent relationship between conservation education program implementation and whether a participant was a science teacher, urban or rural teacher, or male or female. Contrary to popular opinion, the rural, male science teacher is not the only educator ready to include conservation education in the classroom.

As expected, programs were more often developed where the teacher received support from the school administration. Curriculum changes are, to a large degree, dependent on the attitude of the school principal. Perhaps advanced conservation education programs should make an effort to include the principal with the teachers as part of a school team. In schools where implementation took place, the school administrator was influenced by participating teachers. The study also revealed that 140 additional teachers became interested in conservation activities through their association with a teacher who participated in the program.

The summer training program was extended into the school year during the 1978-79 academic year at the co-

Continued.

attention Columbus school is getting, that this will not be the last outdoor classroom the mayor will be asked to dedicate.

The project began through the efforts of Jane Burris, science teacher for grades 2 through 6. After attending a summer course held to train teachers in environmental education, she prepared a proposal for an outdoor learning site. Since the Tulsa County Conservation District had sponsored her attendance at the workshop and paid half of her tuition for the course, they were the first ones she called on for help.

Through the district, she received assistance from the local Soil Conservation Service office and a conservation education specialist from the Oklahoma Conservation Commission. The landscape architect from the SCS State office helped design the area.

Her detailed proposal explained how the outdoor classroom was to be developed, what funds were needed, and how the area could be used by teachers and students—not only in science but in all courses. The proposal was approved by the superintendent of Columbus Elementary School and by the Tulsa Education Service Center. The Parent-Teacher Association donated $500.

Site development began in October 1978 with installation of a fence around the area. Tools and plants were donated by parents. Woodchips for the learning trail came from the Public Service Company of Oklahoma. Two minigrants of $15 each from the conservation district paid for a wildlife packet of plants and more tools. A school work crew prepared the soil for planting and placed logs throughout the area.

The rest of the work was done by the students themselves on bird feeders, a weather station, a garden, native grass plot, and trails. Careful planning protected an existing red ant den. Part of the garden was planted late to allow a kildeer to finish raising her young in a

Continued.

operating universities. A grant from the National Science Foundation helped fund the continuing training for teacher participants of prior summer programs. The purpose of the academic year program is to give teachers an opportunity to work with environmental scientists and to further improve their content background in environmental education while they are in the process of implementing a program in their school. The need for the 1978-79 academic year extension was identified in the 1977 study.

Dr. Mills is professor of science education, Oklahoma State University, Stillwater, Okla.
Ms. Burris is a teacher, Tulsa, Okla., and recipient of the 1977 Conservation Education Teacher of the Year award presented by the Oklahoma Council of the Soil Conservation Society of America.

nest on the ground in one corner. A pond and a wildflower plot still remain to be done.

Some of the plants were cared for by Boy and Girl Scout Troops in the summer, which helped them earn merit badges. Another local Boy Scout Troop made and donated a bird feeder for the site. Parents have also volunteered to help with maintenance of the site during the summer.

Mr. Phillips is public information officer, SCS, Stillwater, Okla.
Mr. Hamilton is district conservationist, SCS, Tulsa, Okla.

More Than a Walk through the Woods

by F. Dwain Phillips
and John R. Bogard

Studying the environment during a week-long workshop is more than a walk through the woods for junior high school students in Osage County, Okla. The students camp out in tents, fish for their supper, cook their breakfast on an open fire, and learn which native plants they can use in a salad. During the week, 40 students from schools throughout the county study wildlife, soil and water conservation, plants, insects, minerals, pollution, and more. Nearly all of their school-learned skills, including the three "R's," are put to practical use in problem solving and ecology investigations.

Ben Sanders, superintendent at the Indian Camp Junior High School at Pawhuska, established the first of these student outings in 1977 after attending a 1-day teachers' workshop sponsored by the Osage County Conservation District and the Soil Conservation Service. He draws upon the volunteer services

Youths at the Osage County conservation camp study soil and plant relationships. They learn how to identify various grasses such as indiangrass, the State grass.

of conservationists, environmental education specialists, water quality experts, a reptile specialist, arts and English teachers, a petroleum engineer, and others to make the camp a valuable learning experience for the students.

The camp is under the sponsorship of the Osage County Conservation District, which contributes $1,000 each year to the camp fund. Others who have contributed funds include several individuals and local businesses, the Pawhuska Kiwanis Club, and Ark-Kay and Kay County Conservation Districts. Part of the money has been used to convert an old school house into a dining hall and classroom for the camp.

During the day, the students are divided into groups of 10 to 12—boys and girls near the same age but from different schools. Each group is assigned a full-time camp counselor who works and eats with the group and is involved in all of the learning activities. Evening recreation includes fishing, sailing, horseback riding, volleyball, or just relaxing with a friend.

SCS provides a training session on soils, using a soils pit and nearby landfill. Sessions on soil and plant relationships were presented so students discovered how soils affect their everyday lives.

An engineering survey problem was added to the second and third workshops. SCS Conservation Technicians Bill Leedom and Bill Thomas and Range Conservationist Pat Broyles gave surveying instructions. Students ran elevation surveys to determine the depth of flooding that might occur at the Bird Creek School from nearby Bird Creek if the dam failed. They also computed the available water supply in Bluestem Lake and the length of time it would supply the city of Pawhuska should a drought occur.

Sanders has formed a corporation known as the Osage County Outdoor Conservation Education Center. He is raising funds to hire a full-time director to coordinate activities at the center. The director would schedule several workshops throughout the year involving county students and would also be available to individual schools and teachers to help them develop outdoor classrooms at school sites.

Sanders expressed his thoughts about the success of the camp when he said, "I've had 10 years of experience in education and these camps have been my most productive educational experiences."

To the kids, it is a fun way to study their environment.

Mr. Phillips is public information officer, SCS, Stillwater, Okla.
Mr. Bogard is district conservationist, SCS, Pawhuska, Okla.

At the camp, junior high school students observe aquatic life and conduct routine water tests at Bluestem Lake, a reservoir for the city of Pawhuska.

Conservation Education in all Directions

In Pennsylvania, conservation education covers a lot of ground. A worm speaks out, a fort lets down its guard, Indian tradition shows the way, and streams give up their secrets for outdoor learning.

Wee Willie Worm

by Jeffrey R. Loser

Wee Willie Worm takes time out from conservation lessons to hug a few human friends.

What is light brown in color, 8 feet long, and goes to school? The correct answer is Wee Willie Worm.

Willie is a teaching tool used by the Allegheny County, Pa., Conservation District to talk to its younger citizens about conservation. Many grade school children have a better understanding of natural resources after a visit from Willie.

The worm was originally created in 1970 by Donna Simmons, program coordinator for the district, as a cartoon symbol for a column in the district's newsletter. Simmons has worked for the district for 16 years and has always tried to promote its goal of conserving the county's natural resources. She developed the Wee Willie Worm character and news column to introduce conservation to children.

As the Wee Willie news column grew in popularity, each article was followed by a quiz. The first five children to send in the correct answers won a Wee Willie Worm T-shirt. Once, an entire sixth grade sent in their answers to one of the conservation quizzes. To their delight, Willie sent them a personal letter of thanks, saying how important it is to take care of the plants, animals, air, water, and soil.

To supplement the conservation news column, Simmons looked for a way to work with groups of children. In 1978, she designed a Wee Willie Worm costume. Now, bigger-than-life, Wee Willie visits county schools.

Through Willie, Simmons talks to elementary school children about how important the soil is to worms and other animals, and to plants used for food, and how soil erosion affects them. Willie helps the children to see the interdependence of all elements of nature, and to understand the meaning of, and need for, conservation.

Willie gives Simmons' lessons a unique twist. She also uses flip charts, soil samples, and slides in her presentations. At the end of her program, she gives each child a "Wee Willie Worm's Workbook," a coloring book with nature puzzles and pictures of different types of plants and wildlife.

Wee Willie Worm also speaks to Girl Scouts, Bible schools, and other children's groups. Willie's even made a guest appearance before a Pennsylvania State University graduate class to talk to teachers about environmental education.

The conservation district directors admit that Wee Willie is an education gimmick—but a serious and effective one. Donna Simmons says, "There is no doubt that this worm brings conservation down to earth."

Mr. Loser is district conservationist, SCS, Pittsburgh, Pa.

Fort Roberdeau Park

by Tim Emenheiser

Fort Roberdeau, in Blair County, Pa., today "guards" the entrance to a thriving outdoor educational laboratory. During the Revolutionary War, the fort protected a lead mining industry from Indian attack. Fort Roberdeau was restored during the Bicentennial and now attracts tourists, especially children's groups, from all over central Pennsylvania.

The adjacent 29-acre tract of mature woodland blossomed into a network of nature trails as a result of the joint efforts of the Blair County Conservation District and the Soil Conservation Service. The trails together with the fort make up Fort Roberdeau Park.

Charles Birchfield, executive assistant for the Blair County Conservation District, was responsible for developing the tract, and was able to hire workers under a $75,000 grant through the Comprehensive Employment and Training Act (CETA) of 1973. With technical assistance from SCS, construction of the trails was completed during the summers of 1977 and 1978.

Most of the materials used for construction of bridges and other park improvements were obtained on the site or donated by local groups.

One project targeted for improvement was the stream which was slow flowing and too shallow to provide fish habitat. With SCS's guidance, the CETA work crew built jack dams to create pools for the fish. They also installed rock riprap to prevent streambank erosion, especially around bridge abutments. The stream is now stocked with brook trout.

Another wildlife habitat improvement was the addition of bird and game feeders which are supplied with food at critical times of the year when natural food is exhausted or heavily covered with snow.

The park is divided by four trails, each of which can be leisurely walked in about 20 minutes. The trail system is well planned and provides safe and easy maneuvering for the very young, older citizens, and the handicapped. The trails are 5 feet wide, covered with bark chips, and have bridges for crossing a mountain spring-fed stream and marshy areas.

Fort Roberdeau Park provides a brochure which maps the trails and describes learning sites and outdoor classrooms which are marked and identified throughout the trails. An outdoor classroom is an improvised "lecture hall," made up of four or five rows of logs split in half and pegged into the ground.

In addition to pointing out the different types of trees, vines, and seasonal wildflowers, the brochure also applies the idea of "reading" the environment, of understanding and looking for signs of interrelationships.

For instance, visitors are excited when they can look at a tree and determine from the brochure that it is a den tree which gives shelter to gray squirrels, or perhaps larger animals such as raccoons. People learn that when they see a sour-gum tree, or the grapevines that cling to its upper branches, they are looking at an important source of food—berries and seeds—for birds and animals.

The trail brochure directs attention to the root system on one uprooted tree which had grown in shallow soil, and to the roots of another fallen tree still clinging to the soil and stones which had once supported it. At a third point of interest, the observer can tell from its exposed roots that a black birch tree started from a seed which sprouted on a tree stump. As the seedling grew, it was fed by the decaying stump.

One learning site stimulates the imagination with a brief lesson in history. The brochure points to a spring feeding the Black Swamp and explains that early settlers submerged their roof shingles in the black muck to render them fire resistant. This afforded them some protection from the Indians' burning torches and flaming arrows.

Fort Roberdeau Park has served more than 2,000 teachers and students since it opened in 1978. The Blair County Conservation District will continue to develop learning opportunities that combine history, natural science, and conservation in Fort Roberdeau Park.

Mr. Emenheiser is district conservationist, SCS, formerly at Hollidaysburg, now Brookville, Pa.

Reviving a Tradition

by Lowell Edminster and Michael Young

The Meesing Nature Center is rekindling the spark of an old tradition in Monroe County, Pa.: the tradition of environmental awareness.

The area was first inhabited by the Lenni Lenapi Indians who understood the balance of nature and lived in harmony with the land. Next came the Pennsylvania Dutch with their neat and well-kept farms. They admired the pristine beauty of the wilderness and, like the native Americans, took only enough game to fill their tables and only enough timber to build shelter. Woodlots were carefully harvested to insure firewood and lumber for future generations.

So it remained until the early 1900's when tourists discovered the grandeur of this countryside. City people wanted to escape the crowded urban areas of nearby New York and Philadelphia, and development became inevitable.

Footpaths widened out to wagon tracks which were replaced by four-lane highways. Teams of oxen and horses gave way to chain saws and bulldozers. Timber stands, as well as family farms, disappeared beneath housing developments.

A plastic container and a magnifying glass used with the right instruction can open the world of aquatic life for observation and study.

Today, the Monroe Conservation District has a big job. The remaining natural resources of Monroe County can only be saved by making people aware of their values. So, Meesing Nature Center was founded in January 1976 to promote conservation through education.

The concept of the nature center was influenced by the late Marvin Burrus, who focused on the district's youth. "Today's young people will be tomorrow's citizens," he reasoned. "Give them an appreciation for nature, and they'll make sound land use decisions when they're grown."

Burrus founded the Junior Conservation Board, which was made up of students representing each of the local high schools. It served as a clearinghouse for ecology events in the schools, as well as for regional activities. The Junior Conservation Board also helped to steer the district's attention to youth activities and education programs, and eventually to the establishment of the Meesing Nature Center.

Many people were responsible for making Meesing a reality. The conservation district engaged Patrick Calpin as executive assistant to organize the center. Calpin hired five naturalists, through the Comprehensive Employment and Training Act of 1973, to help him set up programs, classes, and nature trails. Money was raised through contributions from speaking engagements, memberships, birdseed saving day, and the Campaign to Remove Unsightly Debris (CRUD), where local citi-

zens pledged so much per bag to have litter picked up.

The Pennsylvania Bureau of Forestry supports the center by leasing it 100 acres which are adjacent to another 2,000 in the Delaware State Forest.

Technical assistance has been provided by several State and Federal agencies. The Soil Conservation Service provided aerial photographs for site planning, while local groups took surveys and inventories. An SCS-designed pond was built with Pennsylvania Game Commission equipment. The Youth Conservation Corps helped build 1 1/2 miles of trails through managed woodlands, swamps, and along a stream that runs through the center.

The trails of the Meesing Nature Center are interesting and well planned. They include a self-interpretive trail that winds through a pine forest and hardwoods, a bog trail now under construction, a trail that runs through a clear-cut area in its fifth year of regeneration, and a sensory trail for the visually impaired.

The sensory trail is built with posts about 4 feet high which are connected by a nylon cord at the top. A system of knots in the cord signals the user that he or she is standing at a point of interest. Each time a hiker reaches a knot, he or she turns on a tape recorder (unless accompanied by an interpreter) and is instructed to touch or smell something. Participants with normal sight also walk this trail blindfolded to learn how to use and enjoy their other senses in observing nature. An experimental camp for deaf children at the center successfully completed its first session during the summer of 1979.

On Saturday mornings, the Meesing staff conducts classes on beekeeping, nature photography, useful plants and wildflowers, maple sugaring, and other topics. When the sap is flowing in the sugarbush, the groups of children are told how the Lenapi Indian first gathered this natural sweetener. They then get involved all the way from tapping the tree to tasting the real thing—pure maple syrup.

Teachers take advantage of the center's expert staff. They bring their students to the center to watch birds from an observation blind while they feed at hand-built feeders; to learn how to tell the age of a tree from its growth rings; and to perhaps spot a new plant or animal. And the ecology lesson plan goes on from there—naturally.

When class can't be held in the woods, a little bit of the woods is taken to the classroom. Staff naturalists visit schools with slides and a "discovery box" to give a closeup on wildlife. In the discovery box, the students may find anything from bear skulls to Indian artifacts to a stuffed otter.

When summer comes and school's out, environmental education goes on. Meesing offers a week-long conservation camp in cooperation with the Monroe County Sportsmen's Association and East Stroudsburg State College. You might hear from one of the 30 campers that "there just isn't enough time to do everything!"

The 15- to 18-year-old campers discuss soils, land use, and land management. They participate in archery, mountain climbing, firearms safety, night walks, stream study, fish surveying, a geology tour of the Delaware Water Gap, and canoeing on the Delaware River.

There is a lot happening with the Meesing Nature Center. In only 2 years, since the beginning of the pilot project, 10,500 people have been served. The Pennsylvania Association of Conservation Districts named the Meesing Nature Center the "Outstanding Conservation Organization of the Year 1977." In 1978, the Monroe Conservation District was selected as the Northeast Regional NACD-Allis Chalmers Conservation Education District because of their Meesing project.

Meesing is still building. Plans are underway to construct a log and stone structure to be heated by solar and wood energy both for economy and as a practical teaching opportunity. There will be space for meetings, classes, a library, and research facilities.

Where does this all lead? In environmental education, it's quite true that the "sky's the limit."

Mr. Edminster is district conservationist, SCS, Stroudsburg, Pa.
Mr. Young is photographer, Meesing Nature Center, Stroudsburg, Pa.

Learning Conservation From a Creek

by Richard Heaslip

Manheim Central High School students collect samples with dip nets at Chickies Creek. By identifying the different types of aquatic insects and invertebrates and classifying them according to their tolerance to organic pollution, the students can determine water quality.

Photo courtesy of the *Sunday News*, Lancaster, Pa.

Stooping, scooping, and snooping into the lives of aquatic creatures, 10th and 11th grade students are studying Chickies Creek in Manheim, Pa. Armed with nets, bottles, and portable electronic gear, the students scour the southeast Pennsylvania stream for aquatic insect life and signs of pollution.

The watershed study was started through the efforts of Sam Wenger, a chemistry teacher at Manheim Central High. He wanted to give his students practical learning experience and ignite their interest. In 1973, he began taking them outdoors to study Chickies Creek.

In this outdoor classroom, the students learn how to make different kinds of water quality measurements, and then deduce why certain chemical

A Chemistry Class Helps SCS

Since 1977, the students of Manheim Central High School have been helping the Soil Conservation Service in planning a watershed project for Chickies Creek. The chemistry students' data are being used by SCS to monitor water quality conditions.

During the early 1970's, the local people had identified a flooding problem in the Borough of Manheim, which is located at the downstream end of the 23,000-acre watershed. Representatives of the Lancaster Conservation District and Manheim Borough, and Lancaster County Commissioners were not only concerned with preventing floods but also with reducing the effects of

reactions and conditions exist.

"Streams provide an excellent measure of the environmental quality of our community," reflects Wenger. "This program is designed to enable the student to relate chemistry to present and future realms of experience, and to have a positive feeling toward chemistry."

Wenger further explains the practical side of the course. "The students are asking the questions, and then discovering the answers by actual demonstration or onsite experiment."

One of their first discoveries was the fluctuating presence of dissolved mineral particles in the creek. The students used an electronic meter to run a current between two probes held in the water. This test measured the degree of resistance to the conductivity of electricity. Knowing that specific conductivity increased with the pollution level, the students were able to identify those portions of the stream containing chloride.

The students then traced the source of chloride pollution to the runoff from salt applied to snow-covered roads. This exercise of scientific method and logic gave the students an opportunity to understand the cause and effect principles governing their environment.

The students have conducted over 10,000 water quality tests since 1973. They test for suspended solids; levels of dissolved oxygen, nitrogen, phosphates, and acidity; temperature; and volume flow. They then doublecheck their results by examining the aquatic insect population which is one indicator of water values.

Word has gotten around at Manheim Central High that you not only learn in the chemistry classes, but that you can also have a good time. Students are becoming more aware of their immediate surroundings as they examine the streams around their own homes. They want to see why things happen and begin to pick up on subtle land use changes in their community.

How do the students feel about the course? One student's evaluation best describes their learning experience: "I think we are learning more by discovery than by being told about it."

agricultural activities on Chickies Creek. They applied to SCS for help and became sponsors of a project under Public Law 83-566, Watershed Protection and Flood Prevention Act.

SCS studied the causes and frequency of flooding, and estimated the dollar damages. The next step was to propose alternative solutions, such as dams, dikes, channel modifications, or floodproofing buildings.

In weighing the benefits of each alternative, SCS needed to determine their impacts on the watershed. This requires data on the stream's chemical, physical, and biological conditions. SCS looked for existing sources of information and turned to the long-term monitoring project at Manheim High.

Eager to cooperate, the chemistry class is now coordinating its activities with the watershed project, having modified its testing to meet SCS's needs. The students will continue to work at 10 sampling stations monitoring 13 water quality values.

The chemistry classes of Manheim High will prove invaluable in helping SCS evaluate whatever flood prevention measures and soil conservation practices are installed. The students, in turn, will take part in a unique learning experience.

Mr. Heaslip is wildlife biologist, SCS, Harrisburg, Pa.

Life at Bald Rock

by Charles T. Mathews
and Morris S. Gillespie

A segment of outdoor learning at Bald Rock includes listening to music in nature. Students discuss insect and animal sounds and their musical interpretations.

The 80-acre Bald Rock environmental study area in Randolph County, Ala., has been the scene of learning activities for a good many future teachers and elementary school students for about 10 years.

Southern Union Junior College at Wadley started the environmental education program to help future teachers gain a better understanding of nature as well as experience in working with youngsters in outdoor learning situations. In 1972, the Bald Rock area was designated a National Environmental Education Landmark (NEEL) by the U.S. Department of the Interior. Among the requirements of NEEL projects was an established and ongoing environmental education program at the site.

Bald Rock takes its name from the bare, igneous, large-grained granite rock formation. According to geologists, the granite cooled under the surface when it was formed and later was uncovered by erosion. Many unusual plants grow in cracks between the rocks or in small patches of soil. A stream flows through the study area, and there are swamps and forests of cedar and pine. Wildlife includes snakes and lizards common to the area, wild turkeys, raccoons, possums, and rabbits.

Mary Cu Shivers, a biology teacher at Southern Union Junior College, uses the area extensively in her teaching. She requires her students to teach environmental education to elementary school students from seven surrounding counties each year.

"The Bald Rock study area is the best I have seen for teaching biology," said Shivers. "It has a variety of unique plant and animal life. More than 20 different mosses and many kinds of li-

chens have been identified in the area."

The site is privately owned, but Shivers and other local educators saw the potential for environmental education. The landowners agreed to protect the area from development and to use good forest management when cutting timber outside the study site. Through the Randolph County Soil and Water Conservation District, the Soil Conservation Service provided soil information for developing the nature area and helped identify some of the plant life. SCS also furnishes teaching materials to educators.

As part of their course work, Shivers' college students develop 5-minute lesson plans to use with the elementary school students at Bald Rock. The student teachers work in groups of two with about 10 children in each session. About 150 elementary school students can be taught in 1 day. More than 400 area students in grades 4 through 6 visit the learning center each year.

The student teachers guide the children along one of the $1\frac{1}{2}$-mile nature trails that wind through the area. They stop at individual learning stations where they investigate the natural selection of plants and how wildlife fits into nature's pattern. They study the role of fungi, and how pollution affects the soil, water, and air. The students follow a food chain from one-celled animals to man and learn the value of plants in the food chain. They also find out how rock breaks down to become soil.

At one of the learning stations, students listen to music in nature. They discuss insect and animal sounds and the musical interpretations of the sounds. At another site, they test water quality in the stream that runs through well-managed timberland before reaching the study area and compare it with water brought in from a stagnant pond.

"My college students love teaching the outdoor classroom section at Bald Rock and they benefit as much as the children who are in the sessions," said Shivers. "The most popular session is the one on edible wild foods. We prepare poke salad, sassafras tea, fried dandelion flowers, and cattails."

"The college students do an excellent job of relating to the elementary school students," said Joanne Jordan, director of extended day programs at the college. "Several educators have recognized the benefits of the program and are on the list to bring classes to Bald Rock every year. Several of Shivers' former students, now teaching in the vicinity, bring their classes to the area."

"The children look forward to this trip and it works well with our science schedule," said Alva Jean Arrington of the Woodland School System. Nancy Carolyn Wallace, also from the Woodland system, said, "It's the highlight of the school year for the fourth graders. They look forward to the trip and to learning about the environment."

"The students are motivated to learn when they can experience nature firsthand," said Dorothy Rice of the Wedowee School System. "They remember what they learn at the Bald Rock environmental study area much better than what they learn in the classroom."

John Sartain, an elementary teacher at the Alabama School for the Deaf, said that the school has taken a busload of students to the Bald Rock area for the past 4 years. "Usually at least one student teacher in each group has learned to finger spell," said Sartain. "They learn some of the easier signs and some of the alphabet and the children appreciate the college students taking the time to learn to communicate with them," he said. "Participating in the program is a good activity for the deaf because there are many things for them to see and do. They especially like the session on making food and drink from plants."

Shivers said that about half of her biology students are studying to become teachers, and through the teaching experience at the Bald Rock environmental study area, some of them have decided to go into working with handicapped children.

Mr. Mathews is district conservationist, SCS, Wedowee, Ala.
Mr. Gillespie is public information officer, SCS, Auburn, Ala.

The Jim Hamm Nature Area

by Eldie W. Mustard
and Carrol Hamon

An asphalt trail used for jogging also provides easy access to the nature area for the handicapped and elderly.

Islands were built in "Jim's Pond" to provide nesting sites for waterfowl.

Where a young boy once explored the outdoors on his parent's farm and played on the shores of a big pond, many children now enjoy the same experiences in a nature area dedicated in his memory. Captain James Hamm was reported missing in action in the Vietnam War on March 14, 1968. As a living memorial to their son, his parents, Richard and Emma Alice Hamm, donated 24 acres of their farm to the city of Longmont, Colo., to be used as an environmental study area by the St. Vrain School District.

The Longmont City Council accepted the gift and turned the land over to the Parks and Recreation Department for developing and managing the nature area. A planning committee was named which included Emma Alice Hamm and representatives from the school district, local service organizations, and the Soil Conservation Service.

As the first step in planning, SCS, the Longmont Audubon Society, and the Longs Peak Garden Club prepared a series of natural resource inventories of the site that included soil information, lists of wildlife, and vegetation most suited to the area. The planning committee also consulted teachers in the St. Vrain schools to find out how they could best use the area to teach students about the environment.

Using donations from the Hamm family and others as matching funds, the Longmont City Council applied for U.S. Department of the Interior Heritage Conservation and Recreation Service Land and Water Conservation funds through the Colorado Division of Parks and Outdoor Recreation. The city received $20,000 for use in developing the Jim Hamm Nature Area. The Colorado State University Recreation De-

partment prepared the final plan.

The Longmont Chapter of Jaycees adopted the nature area as one of their service projects, working on weekends and obtaining materials and the use of equipment as donations or at reduced prices.

In donating the land, the Hamms had stipulated that a boundary fence must be installed around the nature area to separate it from adjacent private property. The planning committee suggested that a living fence would be more appropriate than steel and wire. The Hamms agreed, and a five-row tree and shrub planting was installed along the north and west sides to attract wildlife, serve as a windbreak, and separate properties. SCS helped select the trees and shrubs, such as Hansen rose, honeysuckle, sumac, Russian-olive, and honey locust. A pole fence borders the rest of the area.

The nature area pond, known locally as "Jim's Pond," is about 8 acres in size, and had once been used as an irrigation reservoir. Now, it is surrounded by plains cottonwood, Chinese elm, hackberry, willow, and wild plum trees that shelter many kinds of wildlife. Five islands, each about a quarter of an acre, were built in the pond to serve as nesting sites for waterfowl and shorebirds. Canada geese nest in the marshy vegetation on the islands, and blackbirds, mourning doves, and ducks are part of the scene. Also at the pond, a 20-foot boardwalk extends into a marshy area that is too wet to support a hard-surfaced trail, enabling students to observe and study the plant and animal life there without trampling the edge.

A three-sided wooden structure surrounded by vegetation provides a blind from which students observe and photograph wildlife. Winding along the shore of the pond and through the nature area is an asphalt trail to provide easy access for the handicapped and elderly. Other special features are an old-fashioned hand pump and samples of grasses and other plants common to Colorado's eastern plains. A small amphitheater built in a natural depression of materials found in the area seats 30 to 40 people and can be used for discussion groups or for special lectures.

SCS helped select the site for the observation blind, designed the trail system to avoid erosion and water hazards, and helped develop the picnic area. SCS also uses the nature area for training teachers and agency personnel in planning outdoor classrooms.

The St. Vrain School District published two manuals of activities that teachers can use to heighten their students' awareness of the environment. In one activity, eight students position themselves around a tree. Each of them uses two words to describe the tree and they write down each other's words. Each student then uses all the words in a poem about the tree.

In another learning project, students observe how different animals are suited to different habitats. The children make animals that could live in the nature area using carrots or potatoes for the body and collecting pebbles, twigs, berries, leaves, and other materials to make the rest of the animal.

Fourth through sixth grade students study water, land use, and soil. They note the life cycles of ducks, fish, and other wildlife and how weather affects animals. The school district also uses the nature area for its Junior Naturalist Program in which junior high school students lead special field trips for younger children. At one site on the tour, the children pretend that they are an animal that lives there. They have to decide what they would eat and where they would find shelter.

According to Quentin Baker, science coordinator for the St. Vrain School District, the Jim Hamm Nature Area is especially valuable to the school district's environmental education program because of its diversity and its proximity to the city of Longmont. "With the energy situation, we needed something close by for outdoor studies," said Baker.

The Jim Hamm Nature Area serves the schools of Longmont well. It is a tribute to a young man who spent his boyhood on the shores of Jim's Pond and who gave his life in the belief that others should enjoy the same freedoms that he enjoyed.

Mr. Mustard is State biologist, SCS, Denver, Colo.
Mr. Hamon is district conservationist, SCS, Longmont, Colo.

With One Good Example

by James L. Harder

"Many farmers and ranchers take a long time thinking about applying our conservation suggestions and rightfully so, since it's money out of their pockets to pay part of the cost," said Robert Tucker, soil conservation technician with the Soil Conservation Service in Pierce County, Nebr.

"Leonard Hoffman, the only Long Term Agreement participant in the county, took his time, too. But once he knew what he wanted to do and had the money to do it, SCS designed one practice after another for him," said Tucker.

Hoffman began farming in northeast Nebraska in 1943 with his father. "At that time we farmed around some pretty deep gullies in our fields," Hoffman said. "My father had the gullies filled in, but we continued to lose a lot of soil from runoff. We had a hard time getting the gullies to heal right.

"In the mid-1960's, our neighbor built gradient terraces on a big hill which drains across our land," Hoffman continued. "Runoff from this hill was a big factor in causing a gully on our property. Once those terraces were in, I could tell there was less water running into our fields."

When Hoffman began operating the farm on his own in the early 1970's, he made a visit to the local SCS office. His first questions were about shaping, straightening, and establishing a grassed waterway for a ditch on his land. At this time, he signed up to become a cooperator with the Pierce County Soil and Water Conservation District (now the Lower Elkhorn Natural Resources District).

Financial priorities held back Hoffman's conservation planning and application. It was the winter of 1974 before he could see his way clear to begin construction of SCS-designed practices.

"SCS assisted Leonard with developing a conservation plan for his 600-acre crop and livestock farm," said Tucker. Soon afterwards Hoffman signed his Long Term Agreement (LTA) with the local office of USDA's Agricultural Stabilization and Conservation Service. An LTA guarantees farmers or ranchers that a set amount of cost-sharing money will be available to them each year for up to a 10-year contract.

"Since Leonard signed the LTA, we have done a lot of work on his farm," Tucker said. "In 4 years we have laid out 18,300 feet of parallel terraces, 5.3 acres of grassed waterways, 1.1 acre of farmstead windbreak plantings, 30 acres of native grass pasture seeding, one erosion control dam, 1,200 feet of diversion terraces, and 96 acres of irrigation water management."

After a heavy rain in early summer 1977, Hoffman checked the first hill he had terraced to see how it had held up. A diversion had been built at the bottom of the 400-foot hill, which had a 14-percent slope, to protect the sprinkler irrigated bottom. "I could hardly believe it," said Hoffman. "There wasn't enough water coming off that hill to make it to the bottom.

"This past spring I put in another 3,440 feet of parallel terraces and a stock water pond. I still plan to put in more terraces, waterways, and another erosion control dam," Hoffman continued. "When I get all those projects in, the place should be looking good and doing a good job of protecting against erosion."

"We estimated that the annual soil loss on Leonard's farm was about 15 tons per acre before he began installing conservation practices," explained Tucker. "Now, using conservation tillage, a different crop rotation system, and with the terraces, he has cut soil loss to about 4 tons an acre each year."

After farming the parallel terraces for a year, Hoffman said, "Even though the terraces are built parallel, I still have to get used to planting on a curve. Parallel terraces take a little longer to farm, but it's worth it to protect the soil. The slopes where the pushup terraces were built are now easier to farm in a way, too, because of the level bench effect below each terrace."

"Terraces are not easy to 'sell' in the deep rolling silt loam soils of northeast Nebraska," explained Tucker, "but when you have a person like Leonard Hoffman setting an example, hopefully others considering practicing conservation will soon follow."

Mr. Harder was district conservationist, SCS, Pierce, Nebr., and is now district conservationist, SCS, Beaver City, Nebr.

Looking Out for Wildlife

by Gary Gross

Wildlife ponds and plantings attract many kinds of wildlife to the Richter's North Dakota farm.

The Victor Richter family of Burleigh County, N. Dak., is proving that farmers can successfully run a dairy operation, provide food and cover for wildlife, and leave the land in better shape than they found it. The Richters want future generations to be able to enjoy the land and the wildlife—such as deer, pheasant, grouse, partridge, and an occasional moose—that the land supports.

In 1962, the Richters became cooperators with the Burleigh County Soil Conservation District and also signed a contract under the Great Plains Conservation Program. With technical assistance from the Soil Conservation Service, the family has been putting various conservation practices on the land ever since.

Victor's dad, John, initiated the "conservation way of life" on the farm back in 1940 with multiple-row tree plantings.

"These plantings," John said, "are the finest game shelters imaginable, offering year-round protection for upland game, including deer."

The 12 acres of farmstead windbreaks include plantings of Siberian elm, green ash, caragana, cottonwood, and Russian-olive. The field windbreak plantings include 14 miles of Siberian elm, green ash, American elm, caragana, and dropmore elm.

The Richters' 1,880-acre farm includes 800 acres of cropland which is on a rotation of 1-year corn, 1-year oats, and 5-years alfalfa. The family also practices stripcropping to control erosion from runoff water.

On their rangeland they use a pasture rotation system and have installed crossfencing for better control of their cattle.

The Richters have developed two livestock watering ponds, three watering ponds for livestock and wildlife, and eight shallow watering ponds for wildlife only, some as large as 50 by 200 feet.

Wildlife plantings have been established close to watering facilities. They include fruit trees such as plum, golden currant, juneberry, chokeberry, and Russian-olive; evergreens such as eastern redcedar and Rocky Mountain juniper; and crabapple, honeysuckle, Nanking cherry, and sandcherry. Buffaloberry and cottonwood have been left for additional wildlife food and cover.

The Richters also plant 5 acres of corn for deer every year and leave some alfalfa for nesting cover.

During the winter, numerous silage piles can be seen along the road by the Richter farm. "I like to dump a few small piles of silage along the road when I'm feeding my dairy cattle," Victor explained. "This helps the pheasants and the deer winter a bit better, especially during winters like the past one when ice forms a hard crust on the snow."

One project that is the pride and joy of Mrs. Richter and the children is the raising of pheasants for their own use and for release around the area. The chicks are flown in from Wisconsin within 12 hours of birth, around the first of June. They are then fed on a 30 percent protein diet until September when they dress out at 2 to 3 pounds each.

"Every year is a learning experience with these birds," Victor said. "Our biggest problem is predators, so we keep a radio going constantly to keep them away."

The pheasant project has been so successful that the Richters are thinking about doubling the size of their flock.

The Richter family's farm is a good example of how conservation practices benefit farmers as well as wildlife.

Mr. Gross is district conservationist, SCS, Bismarck, N. Dak.

A Lush Valley Assured

Clean Water Models, Part 2

This is the second part of a series on the seven Model Implementation Projects (MIP's) going on throughout the United States (see the October 1979 issue, p. 4). The MIP's are a 3-year test to demonstrate how concentrated cost sharing and technical assistance by the U.S. Department of Agriculture and the U.S. Environmental Protection Agency can help solve agriculture-related water quality problems. The Indiana and Washington MIP's are described here.

by Steve Foland

Little clouds of dust follow walking feet in the Rattlesnake Hills in south-central Washington. The hills and the Yakima River Valley they overlook receive only about 7 inches of precipitation a year. The view to the west from the hills, however, is over the lush green Yakima Valley, which is irrigated, and the snowcapped Mount Ranier 95 miles away in the Cascade Range.

About 300,000 acres of the South Yakima Conservation District were chosen by the U.S. Department of Agriculture and the U.S. Environmental Protection Agency last year as the site for a Model Implementation Project (MIP). The area, which surrounds the town of Sunnyside, supports abundant apple, pear, cherry, prune, apricot, and peach orchards; vineyards; fields of corn, hops, asparagus, grain, and mint; and pastures for horses, sheep, and cattle.

Nearly all of the water for the crops is provided through irrigation districts. Five dams on the Yakima River trap the water in reservoirs upstream in the Cascade foothills and mountains. The water is released from the reservoirs into the river during the growing season. Dams at varied points along the river divert the water into canals that traverse the slopes of the hills on the contour for as much as 90 miles. Two such canals, the Roza and the Sunnyside, run through the south Yakima MIP area.

The Roza Canal runs along the sides of the Rattlesnake Hills. To stay at the same gradient or slope, it turns into or bridges the natural drainageways and runs around or cuts through the ridges between the drainageways. Some of the water from the Roza is pumped farther up the hillsides for irrigation. Most of the water, however, flows by gravity from the canal and irrigates lower-lying fields.

The Sunnyside Canal runs at a lower elevation and irrigates the more level land between the Roza Canal and the Yakima River. The Sunnyside carries much more of the area's silty soil than the Roza. This is because some of the tailwater from the Roza lands that is not used by the crops or that does not evaporate runs into the Sunnyside Canal carrying eroded soil particles with it.

Although both canals have their sources in the Yakima River and both canals drain into the river, entire towns, hills, ranches, and farms separate the canals from each other and from the river. The large quantities of water released from the canals run over the intervening land and have the potential to pollute the Yakima River and its tributaries with sediment, chemicals, and pesticides.

Cattails flourish in a sediment retention basin at the foot of a new vineyard. The sprinkler system brings the desert soil to life but does not cause severe erosion.

An area of 64,000 acres was designated as having the greatest need for conservation practices. Within the 64,000 acres, two areas of 11,000 acres each were designated as priority areas. These two areas are located on irrigated land on the sides and at the base of the Rattlesnake Hills. The remaining 42,000 acres may receive MIP assistance as time and resources permit.

Priority area I, the land most in need of conservation treatment, is in the northeastern part of the MIP area around the upper reaches of the Sulphur Creek drainageway. The area has long been a source of sediment pollution in the Yakima River. A South Yakima Conservation District steering committee of local farmers decided that cost-share money and technical assistance would be concentrated in priority area I during the first year of the MIP. Money and assistance is now being concentrated in priority areas I and II.

According to MIP District Manager Cliff Eckhardt of the South Yakima Conservation District, the district involvement, the money, technical assistance, and information and education program provided to landowners in the Sulphur Creek drainage area, along with voluntary practices and management initiated by the farmers, should, by the end of the year, significantly reduce the amount of sediment reaching the Yakima River through the creek.

"If we could just get away from furrow irrigation and into sprinkler irrigation on the steep slopes," said Soil Conservation Service Project Leader Ken King, "we would be a long way toward having the problem licked." King pointed out that 4,500 acres of prime farmland in the MIP area has the potential for operating under gravity-pressurized sprinkler irrigation systems.

"Sprinkler systems are virtually nonerosive if the water applications do not exceed the soil's ability to take in the water," said King. "And the energy saved by gravity feed could be enormous. Many operators would not have to pump at all, and many others could reduce the horsepower of their pumps."

Many other practices for best managing irrigation water are being recommended, cost shared, and installed in the MIP area. The lengths of furrow irrigation runs are being shortened. Operators are wetting the soil before the first irrigation of the season to hold down the serious erosion that occurs when water runs rapidly over dry soil. Grassed filter strips are being established or maintained along waterways to reduce the sediment load in the water and at the tails of furrow runs to filter out sediment. Sediment retention basins are being installed, and pump-back systems are being used to save water, to prevent sediment from leaving a farm, and to return some sediment to the fields from which it came.

All in all, the water management practices being installed and used in the Yakima Valley should make the area an ideal model for irrigation farmers and ranchers everywhere. Each practice is designed to conserve the area's precious water, to insure an abundant crop yield, and to reduce erosion and the sediment pollution that accompanies erosion.

Mr. Foland is chief, conservation news and reports branch, SCS, Washington, D.C.

Automated Pollutant Nabber

by Joe B. Hays

Sophisticated stream monitoring devices, along with computers, are simplifying water quality analysis in the Eagle Creek and Stotts Creek watersheds in central Indiana. The two watersheds make up the Indiana Heartland Model Implementation Project (MIP)—a special demonstration in reducing nonpoint source pollution from agricultural land.

The Eagle Creek and Stotts Creek watersheds were selected for the project from 79 other watersheds in the Heartland Region. The major emphasis in the Heartland MIP is on reducing the amount of sediment and other pollutants related to farming that are washed into the creeks each year.

In 1978 and 1979, USDA's Agricultural Stabilization and Conservation Service (ASCS) obligated $600,000 in Agricultural Conservation Program cost-share funds to help farmers in the MIP area apply "best management practices" (BMP's) to their land. BMP's are the conservation practices recommended by the Soil Conservation Service to be the most effective and practical means for controlling nonpoint source pollution. Some of the BMP's that farmers in the Heartland Region are applying include conservation tillage, terraces, sod waterways, critical area treatment, sediment basins, and animal waste control facilities.

The effectiveness of the BMP's will be analyzed by a computer modeling program called "ANSWERS." Directed by Larry Huggins and David Beasley of Purdue University, ANSWERS can simulate field and weather conditions and estimate soil loss under a variety of different farming practices. Sediment predicted by the computer's storm events will be verified by data from stream monitoring stations in the Eagle Creek and Stotts Creek watersheds.

To monitor the streams researchers from Purdue University are using automatic stream samplers and special freezer units to store up to 80 water samples at sites in each watershed during storm events. Some water quality characteristics such as temperature, stream flow, acidity or alkalinity, and oxygen levels are monitored continuously and the data are transferred to the computer by telephone. "Given the short duration of the MIP, only 3 years," said Huggins, "ANSWERS will help quantify the water quality effects of different BMP's."

A land use computer profile of the area is being provided by the Holcomb Research Institute at Butler University in Indianapolis. In addition, the aquatic life in the streams is being studied by James Gammon of DePauw University's Zoology Department. The various research activities are being supported by funding from the U.S. Environmental Protection Agency.

David Beasley (left) of Purdue University explains the flow measuring weir on Stotts Creek to Joe Hays, SCS soil conservationist and MIP coordinator.

Angela Preston, MIP coordinator with the Indiana Heartland Coordinating Commission (IHCC), said, "Evaluation of the project is a unique research effort involving three universities and local public participation."

Also unique in the Heartland project is the coordination between U.S. Department of Agriculture agencies and IHCC, which is the areawide water quality planning agency in central Indiana. The project is a team effort involving agencies and organizations in six counties. They include the local soil and water conservation districts, the Science and Education Administration-Extension, SCS, ASCS, and the Indiana Department of Natural Resources. A special MIP Local Policy Group reviews the research and helps direct the project.

With help from their sophisticated monitoring system, conservationists in the Indiana Heartland are working to show landowners that BMP's can and do reduce sedimentation and pollution in streams, rivers, and lakes.

Mr. Hays is a soil conservationist, SCS, Indianapolis, Ind.

News Brief

"Mystic Mountain" Gives Players Practice in Land-Use Planning

"Mystic Mountain" is a new land-use planning game that challenges players to come up with a series of land-use plans that will meet continually changing national needs for timber, recreation, and other forest resources. The game condenses 75 years of the future of the hypothetical "Mystic Mountain National Forest" into 4 hours of playing time.

In the first part of the game, teams of two or three people determine what portions of Mystic Mountain should be developed, logged, or preserved over the next 15 years. In the four playing periods that follow—each representing 15 years—they make further decisions about what to do with the land. As they move from one planning period to the next, players may be faced with a new "scenario" of national conditions.

"The game stresses that the future is uncertain," says one of its developers, researcher Edward C. Thor of the Pacific Southwest Station's Land-Use Planning Unit in Berkeley, Calif. Players who plan for an uncertain future, preserve enough options to meet changing demands, and realize that some activities in some locations cut off more options than others, will be winners in the "Mystic Mountain" game and will probably be winners in real-life land-use planning as well.

Details on the game, along with a game map, set of rules, and instructions for the leader, are in the publication, "Mystic Mountain: an educational alternative futures wildland planning game," by Edward C. Thor and James L. Creighton (General Technical Report PSW-30-FR18). Single copies are available without charge from the Pacific Southwest Forest and Range Experiment Station, U.S. Department of Agriculture, Forest Service, P.O. Box 245, Berkeley, Calif. 94701.

Meetings:

November	
4-7	The Irrigation Association, Marco Island, Fla.
5-8	The Geological Society of America, San Diego, Calif.
5-9	National Adult Education Association, Boston, Mass.
7-9	Future Farmers of America, Kansas City, Mo.
11-14	National Agricultural Bankers, Salt Lake City, Utah
11-14	National Association of State Universities and Land Grant Colleges, Washington, D.C.
11-14	National Forest Products Association, Palm Springs, Calif.
12-20	The National Grange, Lancaster, Pa.
15-16	National Conference on Soil Conservation Policies, Washington, D.C.
25-29	American Institute of Chemical Engineers, San Francisco, Calif.
December	
2-5	American Society of Farm Managers and Rural Appraisers, Inc., Chicago, Ill.
3-7	American Geophysical Union, San Francisco, Calif.
3-7	Symposium on Surface Mining Hydrology, Sedimentology and Reclamation, Lexington, Ky.
4-7	Western Forestry Conference, Spokane, Wash.
6	Keep America Beautiful, Inc., New York, N.Y.
10-14	American Society of Agricultural Engineers, New Orleans, La.
28-30	American Agricultural Economics Association, Atlanta, Ga.
January	
3-8	American Association for the Advancement of Science, San Francisco, Calif.
6-10	American Farm Bureau Federation, Phoenix, Ariz.
7-11	North American Game Breeders and Shooting Preserve Association, Orlando, Fla.
13-14	Land & Water Conservation Exposition, Des Moines, Iowa
17-21	National Wool Growers Association, San Diego, Calif.
21-25	National Cattlemen's Association, San Diego, Calif.

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RCA

Responding to the requirements of the Soil and Water Resources Conservation Act of 1977 (RCA), the U.S. Department of Agriculture is progressing with its appraisal of the Nation's non-Federal soil and water resources, developing a national soil and water conservation program, and preparing a statement of policy concerning these resources.

During the summer and fall of 1979, several important RCA activities took place.

Draft Appraisal Part I

On September 4th, Draft Appraisal Part I, the first of four RCA documents, was released for public review. Draft Appraisal Part I analyzes the status and condition of soil, water, and related resources—wetlands, riparian vegetation, fish and wildlife habitat, windbreaks, organic residues, and recreation. The information on the quantity and quality of these resources is supplemented with statistical data on land and water, land capability, dominant soil conditions, and major uses of non-Federal land.

Part I of the 1980 Appraisal also contains an inventory of legislation and regulations dealing with resources and discusses the impact of technology on agricultural production and conservation. In addition, it identifies resource areas that concern the public and compares these concerns with available data on conservation problems.

Response Analysis Center

A major component of the 1979-80 RCA process is the analysis of public written comments received in response to RCA document contents and comments received at the regional meetings being planned during the 60-day public review period later this winter. A special temporary office has been set up to accept and handle public responses. The Soil Conservation Service has obtained space at the U.S. Navy Supply Corps School in Athens, Ga., for use as the RCA Response Analysis Center (RAC). At the center local citizens will be hired and trained to handle the responses in a manner required to successfully capture public reaction to RCA document contents.

Manly Wilder, SCS Deputy State Conservationist in Pennsylvania, was named RAC director. Additional SCS staff from around the country will be detailed to the center to supervise response coding, quality control, and other functions.

Public Briefings

Public briefings were held in Washington, D.C., in August and September to familiarize news media, national organizations, and interested citizens with RCA. Major agenda items included discussion of conservation objectives and alternative programs being considered. M. Rupert Cutler, Assistant Secretary for Natural Resources and Environment, conducted the briefings.

To Come

Forthcoming RCA activities include publication and distribution of the final three RCA documents; the 60-day public review period; and the regional meetings allowing the public to react to RCA and document contents.